

**U.S. Department of Energy
Office of Inspector General
Case No. I01HQ005**



REPORT OF INQUIRY:

Yucca Mountain Project

April 23, 2001



U.S. Department of Energy
Office of Inspector General
Washington, DC 20585

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MEMORANDUM FOR THE SECRETARY

FROM: *Greg Friedman*
Gregory H. Friedman
Inspector General

SUBJECT: Special Review of the Yucca Mountain Project – Case No. I01HQ005

The effort to identify a suitable site for the disposal of the Nation's high-level nuclear waste and spent nuclear fuel is one of the most sensitive and complex challenges faced by the U.S. Government. Under the Nuclear Waste Policy Act, as amended in 1987, the Yucca Mountain site in the State of Nevada is the only site in the United States to be evaluated for this purpose. The Act established a formal, step-by-step methodology for making this evaluation. For the State of Nevada and all other interested parties, the process to evaluate Yucca Mountain as the potential repository has enormous implications. Perhaps paramount among concerns expressed is that the consideration and evaluation be objective, and based on sound and unbiased scientific analysis.

In December 2000, U.S. Senator Harry Reid and former Secretary of Energy Bill Richardson, in separate letters, requested that the Office of Inspector General determine whether the creation and circulation of certain documents during this process reflected bias in the evaluation of the suitability of Yucca Mountain. Part of this request included concerns that appropriated funds may have been used improperly for lobbying purposes.

The Office of Inspector General inquiry focused on the authorship, review and distribution of three documents: (1) multiple versions of the draft Site Recommendation Consideration Report; (2) multiple versions of the draft Overview to the Site Recommendation Consideration Report; and, (3) a 2-page Note, which was attached to one version of the draft Overview. The Report's stated purpose was to "...describe the results of site characterization, the waste forms to be disposed, the preliminary design of the repository and the waste packages, and the results of assessments of potential repository performance." Additionally, it served to provide "...a basis for public and stakeholder comments to be considered before any recommendation by the Secretary."

A summary of our findings follows:

1. We found that there were several statements in the draft Overview and the Note that could be viewed as suggesting a premature conclusion regarding the suitability of Yucca Mountain (page 8); and,
2. We could not substantiate the concern that bias compromised the integrity of the site evaluation process, or that the Department or its contractors considered a formal or informal strategy for supporting the site characterization recommendation in violation of the law (page 11).

Our conclusions, with respect to the Yucca Mountain evaluation process leading up to and including the draft Site Recommendation Consideration Report, are based on interviews of nearly 200 knowledgeable Federal and contractor officials; reviews of thousands of pages of relevant documents; and, our review of the activities of the Nuclear Waste Technical Review Board.

We coordinated this matter with the Public Integrity Section of the U.S. Department of Justice, which advised that the facts presented did not establish a potential violation of the applicable criminal lobbying statute.

Subsequent to our review of the documents cited above and the completion of our field work, we were informed that the Department decided that it would not release the Site Recommendation Consideration Report and the Overview. It is our understanding that the Office of Civilian Radioactive Waste Management now intends to issue a document entitled, "Yucca Mountain Science and Engineering Report." The stated purpose of this report is to "...describe the results of scientific and engineering studies completed to date, the waste forms to be disposed, the repository and waste package designs, and the results of the most recent assessments of the long-term performance of the potential repository."

From the outset, the focus on the Yucca Mountain site as the potential repository for the Nation's high-level nuclear waste has been controversial. Based on correspondence received by the Office of Inspector General, it is fair to observe that, at least in some quarters, public confidence in the Department's evaluation of Yucca Mountain has eroded. Under these circumstances, as the Department moves forward with the evaluation process, including the preparation and issuance of any new documents, we believe that the Department's senior managers should take the opportunity to: (1) re-affirm the commitment to a site suitability evaluation process which is objective, unbiased and based on the best possible science; and (2) review its internal and contractor processes to ensure that this objective is faithfully executed.

REPORT OF INQUIRY
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I. SCOPE AND METHODOLOGY

The objective of our inquiry was to review allegations of potential bias within U.S. Department of Energy (Department) and contractor operations during the evaluation of the Yucca Mountain site, and concerns that appropriated funds may have been used improperly for lobbying purposes. The inquiry focused on the authorship, review and distribution of three documents: (1) multiple versions of the draft Site Recommendation Consideration Report; (2) multiple versions of the draft Overview to the Site Recommendation Consideration Report; and, (3) a 2-page note, which was attached to the October 2000 version of the draft Overview.

For the purposes of our review, the word “bias” was defined as an inclination or preference, one that interferes with impartial judgment. In this context, the Office of Inspector General developed working criteria to assist inquiry team members with identifying indicators of possible bias. The criteria included:

- Possible non-adherence or non-compliance with established statutory, procurement, and procedural guidelines;
- Unsupported or misrepresented information, direction, and positions with respect to specific issues or the project evaluation as a whole; and,
- Department or contractor formal or informal strategies for supporting, without basis, the site recommendation of Yucca Mountain.

The inquiry involved the review and analysis of numerous documents and the interview of nearly 200 witnesses across 16 states and the District of Columbia. Witnesses included Federal and contractor officials from the Department’s Office of Civilian Radioactive Waste Management (OCRWM), Yucca Mountain Project Office, Office of General Counsel, and national laboratories. We also interviewed senior personnel from TRW Environmental Safety Systems, Inc. (TRW), and its subcontractors, each member and selected staff of the Nuclear Waste Technical Review Board, and senior staff of the Nuclear Regulatory Commission.

We identified and analyzed legislative, procurement, and procedural guidelines associated with the evaluation of Yucca Mountain. We also examined the procedures used by OCRWM and the Yucca Mountain Project Office for developing and authoring scientific studies and analytical and process model reports; initiating contract and other procurement related actions; developing and implementing quality assurance procedures and training; and, developing documents for internal and external consumption.

The Office of Inspector General did not perform an assessment of the validity of the technical and scientific analysis generated in association with the site evaluation process.

II. BACKGROUND

Under the Nuclear Waste Policy Act of 1982 (Act), the Federal Government assumed responsibility for providing for the permanent disposal of the Nation's civilian spent nuclear fuel and high-level defense radioactive waste. The Act adopted geologic disposal as the Nation's long-term strategy for managing radioactive wastes. It also created OCRWM within the Department and charged the Secretary of Energy with the siting, construction and operation of potential repositories for the disposal of this waste.

In 1987 the Act was amended, and the Department was directed to focus on Yucca Mountain to determine its suitability as the sole candidate for the repository. The amendment to the Act also established the Nuclear Waste Technical Review Board as an independent Federal agency, to evaluate the technical and scientific validity of the Department's efforts to study Yucca Mountain.

According to Section 114 of the Act, the Secretary of Energy is required to hold public site consideration hearings in the vicinity of Yucca Mountain at such time that the site is being considered for potential recommendation to the President of the United States. The Act establishes that the Secretary may consider recommendation of the site upon completion of site characterization and consideration hearings. If, upon completion of the hearings, the Secretary decides to recommend approval of the site to the President of the United States, the Secretary must notify the Governor and Legislature of the State of Nevada of the proposed decision. The Secretary must wait

30 days following notification to Nevada officials to submit a Site Recommendation Report to the President recommending approval of the site. If the President recommends the site to the U.S. Congress, and the site is approved, the Department may then apply to the Nuclear Regulatory Commission for a license to construct a repository at the site.

In May 1996, the Department initiated a 5-year program of work to support a decision by the Secretary by 2001, on whether or not to recommend Yucca Mountain as the repository site.

In 1999, OCRWM initiated development of the Site Recommendation Consideration Report, which is not mandated by the Act. TRW had primary responsibility for producing the report, and supporting data were compiled and written by assorted Department, contractor, national laboratory and other Government personnel. According to Fiscal Year 2000 through 2003 guidance from the Department to TRW, in preparation for the site recommendation consideration hearings, a report will be developed to inform the public, the States, affected Indian tribes, and other stakeholders. The guidance further states that information in volumes 1 and 2 of the report will be compiled and be subject to public review and comment. According to the Site Recommendation Consideration Report, it serves to "...describe the results of site characterization, the waste forms to be disposed, the preliminary design of the repository and the waste packages, and the results of assessments of potential repository performance. The information presented here provides a basis for public and stakeholder comments to be considered before any recommendation by the Secretary."

The Department and its contractors prepared annotated outlines jointly in the initial stages of the Site Recommendation Consideration Report's development, denoting the content and format of its various sections. The authors of these sections referred to compiled scientific and technical data when writing the Site Recommendation Consideration Report. Reviewers, separate and apart from the authors, identified errors in the sections and indicated where additional information was required or recommended.

The Site Recommendation Consideration Report initially consisted of two volumes, intended to describe the technical information pertaining to Yucca Mountain for use by the public and government officials during consideration hearings. A third volume was added to address concerns

by the Nuclear Waste Technical Review Board and others over remaining uncertainties as the program moved toward possible site recommendation. The Office of Inspector General was informed that the Site Recommendation Consideration Report was developed using seven key-supporting documents, including:

- Analysis and Modeling Reports;
- Process Model Reports;
- Repository Safety Strategy;
- System Description Documents;
- Preliminary Pre-closure Safety Evaluation;
- Total System Performance Assessment; and,
- Yucca Mountain Site Description.

In 2000, OCRWM initiated development of the Overview to the Site Recommendation Consideration Report. The Department tasked TRW to produce the Overview. TRW, in turn, assigned the writing of the Overview to JK Research Associates, Inc. According to Fiscal Year 2001 guidance from the Department to TRW, “The necessity of the [Site Recommendation Consideration Report] overview is defined by the need to summarize and explain the basis for the Secretary of Energy’s consideration of a possible recommendation....” The Fiscal Year 2001 Statement of Work for JK Research Associates included general direction to develop an Overview of approximately 50 pages that summarizes the information in volumes 1 and 2 of the Site Recommendation Consideration Report. According to page one of the Overview, it “...summarizes information presented in the *Site Recommendation Consideration Report* and other technical reports, and provides additional information about U.S. policy on disposing of the nation’s nuclear waste. The *Overview* and the *Report* are intended to serve as the basis for public comment on the Secretary’s consideration of the Yucca Mountain site.”

Based on timelines developed during our review, we found that the Overview underwent approximately 18 draft revisions. Senior officials told us that the draft revisions were sent internally to Department, contractor, and Nuclear Waste Technical Review Board representatives for review and comment.

We were informed at the initiation of the Office of Inspector General inquiry that a decision to release the Site Recommendation Consideration Report and the Overview would be held in abeyance pending completion of our review, while activities relating to the evaluation of Yucca Mountain would continue.

III. FINDINGS

- A. *We found several written statements in key Yucca Mountain evaluation documents that could be considered by an impartial observer to be prematurely conclusive, or inappropriately advocating a position by the Department or its contractors.*

Two of these statements were found in the “Note to Reviewers of the [Site Recommendation Consideration Report] Overview,” which was written by JK Research Associates and attached to a draft of the “Yucca Mountain Site Recommendation Consideration Report: Overview.” We learned that the Note appeared only with the October 2000 draft, and had not been included in any prior or subsequent versions. The statements are as follows:

“To resolve the question of the appropriate tone for the Overview, we have assumed that the ‘author’ is the OCRWM Director and that the purpose of the document is to convey the Director’s recommendation that the Secretary recommend the site. Therefore, the Overview makes a convincing case that Yucca Mountain is a technically suitable site for a repository, though a formal suitability finding will not have been made.”

“...the primary message is that [the Department of Energy] has a comprehensive plan to solve the nation’s nuclear waste problem and that a Yucca Mountain repository is the key component in that comprehensive solution.”

Other questionable statements were found in the December 2000 version of the draft Overview, with similar language appearing in the October and November versions. They are as follows:

“Based on over 20 years of scientific and engineering work, [the Department of Energy] believes that a repository can be safely constructed and operated at the Yucca Mountain site in a manner consistent with the safety standards proposed by [the Environmental Protection Agency] and the licensing requirements proposed by [the Nuclear Regulatory Commission].”

“All of the evidence to date indicates that Yucca Mountain is an appropriate site for a repository that can achieve the purposes of the [Nuclear Waste Policy Act].”

Contrary to the apparent message conveyed in the statements, the purpose of the Overview was to summarize information in the Site Recommendation Consideration Report and other technical reports, and provide additional information about U.S. policy on disposing of the nation’s nuclear waste. The Overview, along with the Site Recommendation Consideration Report, is intended to serve as the basis for public comment on the Secretary’s consideration of the Yucca Mountain site.

The Act requires that the Secretary hold public hearings in the vicinity of the Yucca Mountain site for purposes of informing the residents of the area and receiving their comments regarding consideration of a possible recommendation of the site. If upon completion of the hearings the Secretary decides to recommend approval of the site to the President of the United States, the Secretary must notify the Governor and Legislature of the State of Nevada of the proposed decision. The Secretary must wait 30 days following notification to Nevada officials to submit a Site Recommendation Report to the President recommending approval of the site.

In the context of the statutorily mandated process described above, we concluded that a fair reading of the draft Overview suggests a premature position supporting a recommendation to the President, *prior to* public hearings and notification of Nevada officials and receipt of their comments. We learned that Department and contractor representatives provided feedback to JK Research Associates at various stages of the Overview’s revision. Available evidence confirmed that JK Research Associates was advised that the draft Overview contained statements that were inappropriately conclusive. The Office of Inspector General did not find similar statements in the draft Site Recommendation Consideration Report.

When interviewed, JK Research Associates informed the Office of Inspector General, in part, that the purpose of the Overview was to provide a broad audience with a brief summary of the technical information presented in the Site Recommendation Consideration Report and other reports, in addition to background information on the program as a whole and related U.S. policy. The company stated its belief, however, that it would be irresponsible for the Department to issue the

Site Recommendation Consideration Report and Overview, and request the public's involvement, if it did not have a reasonable degree of confidence that the site could meet technical requirements.

JK Research Associates added that its intent was not to communicate that the Department or the Secretary had already decided to recommend Yucca Mountain. In support of this assertion, the following excerpt was identified in the "Note to Reviewers of the [Site Recommendation Consideration Report] Overview":

"The purpose of the Overview is to provide the basis for comments by anyone and everyone who wishes to comment on the Secretary's consideration of the site. This broader public audience includes the residents in the vicinity of Yucca Mountain and other interested and affected parties, including States and Tribes through whose jurisdiction waste will be transported to a Yucca Mountain repository."

Additional support was also found in the December 2000 version of the draft Overview of the Site Recommendation Consideration Report, which was written by JK Research Associates and included the following statement:

"The Secretary will hold public hearings in the State of Nevada in 2001 to inform area residents that recommendation of the site is being considered and to receive their comments."

Concern had also been expressed about the following statement in the "Note to Reviewers of the [Site Recommendation Consideration Report] Overview":

"In fact, the technical suitability of the site is less of a concern to Congress, than the broader issue of whether the nuclear waste problem can be solved at an affordable price in both financial and political terms."

When interviewed, JK Research Associates informed the Office of Inspector General that this portion of the Note was intended to advise reviewers that the draft Overview was designed to provide a broader context beyond technical suitability by also addressing other issues, such as cost, transportation, and community concerns, that are recognized as being important considerations in the final recommendation decision. JK Research Associates stated its belief that Congress is less concerned with technical suitability because it has the Nuclear Waste Technical Review Board to evaluate technical aspects of the Yucca Mountain site.

Although this may have been the intent of the drafters, the Office of Inspector General concluded that this statement could be interpreted as downplaying the relative importance to the Congress of the technical suitability of Yucca Mountain in a manner inconsistent with the Nuclear Waste Policy Act.

B. *We could not substantiate the concern that bias compromised the integrity of the site evaluation process, or that the Department or its contractors considered a formal or informal strategy for supporting the site characterization recommendation in violation of the law.*

The Office of Inspector General reviewed and analyzed numerous documents and conducted over 200 witness interviews with representatives from the Department's OCRWM, Yucca Mountain Project Office, Office of General Counsel, and national laboratories, as well as senior personnel from TRW and its subcontractors, and the Nuclear Regulatory Commission. We did not, based on these record reviews and interviews, develop any additional data that would support the concern that bias compromised the integrity of the site evaluation process, or that a formal or informal strategy had been developed to support the site characterization recommendation in violation of the law.

Furthermore, the Office of Inspector General interviewed each of the 11 members of the Nuclear Waste Technical Review Board, and reviewed relevant Board documentation, regarding the issue of potential bias in the evaluation process. The U.S. Congress created the Board in 1987 as an independent agency within the executive branch of the Federal Government. The Board consists of individuals nominated by the National Academy of Sciences for appointment by the President. The Board does not direct the activities of the Department but, rather, evaluates the technical and scientific validity of activities undertaken by the Secretary of Energy to characterize Yucca Mountain for its suitability as a location for a repository. The Board reports its findings, conclusions and recommendations to the U.S. Congress and the Secretary at least twice annually. Additionally, the Board has held public hearings in the vicinity of Yucca Mountain and other

locations, and has reported the results to the Director of OCRWM. The Board also meets periodically with Department and contractor officials.

Based on discussions with members of the Board, and a review of its reports to the U.S. Congress and the Secretary of Energy that are in the public domain, we learned that the Board has raised scientific and technical issues regarding the proposed Yucca Mountain repository. However, based on our direct questioning of the Board's membership, there was no indication that bias compromised the integrity of the Department's evaluation of the Yucca Mountain site. Because of the Board's independent charter and the distinguished credentials of its membership, this finding carried significant weight in reaching our overall conclusion regarding the integrity of the Yucca Mountain evaluation process.

IV. COORDINATION WITH THE DEPARTMENT OF JUSTICE

Concerns had also been raised to the Office of Inspector General that appropriated funds may have been used improperly for lobbying purposes. This was based, in part, on a statement in the "Note to Reviewers of the [Site Recommendation Consideration Report] Overview." Specifically, JK Research Associates wrote that the Overview "...provides information that potential supporters can use in expressing support for a site recommendation" but that "It is not intended to convert those who oppose a Yucca Mountain repository or any solution to the nuclear waste problem."

The Office of Inspector General coordinated with the Public Integrity Section of the U.S. Department of Justice. The purpose of the coordination was to allow the Department of Justice to evaluate whether information in the "Note to Reviewers of the [Site Recommendation Consideration Report] Overview" or the Site Recommendation Consideration Report Overview constituted a possible violation of the criminal lobbying statute. The Department of Justice advised that no violation had occurred.

V. OTHER MATTERS

Our review disclosed several additional matters that the Department needs to consider as it proceeds with the evaluation of the Yucca Mountain site. Specifically, several witnesses were critical of a Department or contractor position, report, or process relating to Yucca Mountain.

One witness, for instance, stated that he was not aware of any information being misrepresented in technical documents or Department or contractor bias regarding the evaluation and potential recommendation of Yucca Mountain. He expressed the belief, however, that more studies should be conducted in the areas of low-temperature operating conditions and the discovery of “Chlorine 36.”

A second witness stated his belief that the Department has not created incentives for people to question computer modeling assumptions or to “rock the boat.” The witness stated that while the Department has changed assumptions when given supporting data, two factors must be true before assumptions will be changed: (1) the evidence must be unambiguous, and (2) the resulting change cannot threaten the program. The witness had no examples, however, of bias, efforts to cover-up evidence threatening to the program, or an organizational conspiracy to conceal safety problems at the site.

Two other witnesses expressed concern over the methodology by which the Site Recommendation Consideration Report was authored and reviewed. One witness said that the Site Recommendation Consideration Report’s referencing process denied scientists proper credit for the work they performed. The other witness advised that during the final stages of preparing the Site Recommendation Consideration Report, sections of the report were transferred to members of a contractor Senior Support Team, which made changes without further input from the authors. The witness stated his belief that none of the changes were deliberate or significant, and that he was unaware of any misrepresented or unsupported information in the Site Recommendation Consideration Report.

One of the documents supporting the Site Recommendation Consideration Report was the “Repository Safety Strategy” (RSS). The RSS explains the roles that natural and engineered systems of a potential Yucca Mountain repository are expected to play in containing radionuclides within the waste package over a period of thousands of years. The RSS was developed using formal and approved quality assurance measures. The RSS had multiple authors. One witness expressed concerns that the review schedule for this document was too short and that it was not designed to capture technical errors. While this is an important concern, no other witness interviewed by the Office of Inspector General raised this issue.

We also found that the December 2000 version of the draft Overview was not subjected to the same standards of quality assurance review as the other key documents. The draft Site Recommendation Consideration Report and supporting documents were subject to a structured quality assurance process as part of an overall management plan. This process included informational cross-indexing by non-authors and certifications of content accuracy. The Site Recommendation Consideration Report had a formal mechanism for tracking reviewer comments and author feedback. The mechanism, an extensive electronic “storyboard,” is part of a detailed historical record of the development of the Site Recommendation Consideration Report.

JK Research Associates provided cross-indexed and referenced copies of the November and December 2000 versions of the draft Overview which had been distributed internally to the Department, contractors and the Nuclear Waste Technical Review Board for review. We found that there was no formal mechanism for tracking reviewer comments of the various versions of the draft Overview. The Office of Inspector General was informed that feedback was provided via one-on-one personal discussions, email messages and telephone calls. According to JK Research Associates, complete electronic mail records were unavailable to the Office of Inspector General due to a computer malfunction. Consequently, because a complete record of interactions between the contractor and the reviewers was not available, the Office of Inspector General was unable to obtain a complete, verifiable history of the development of the draft Overview.